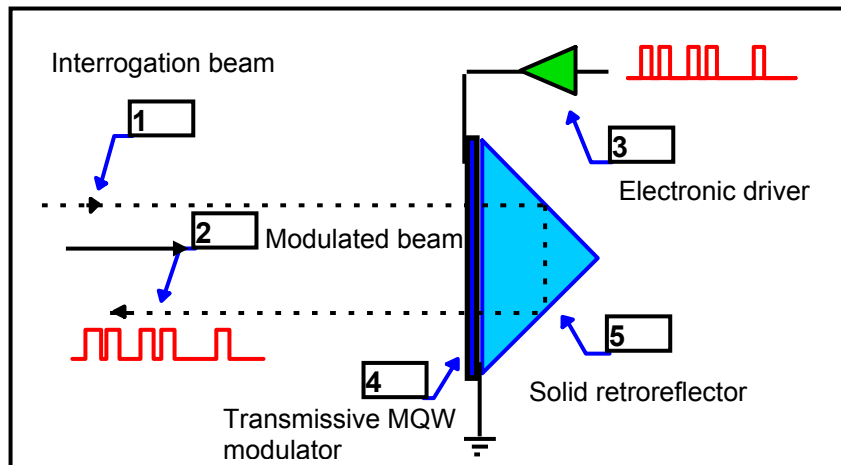
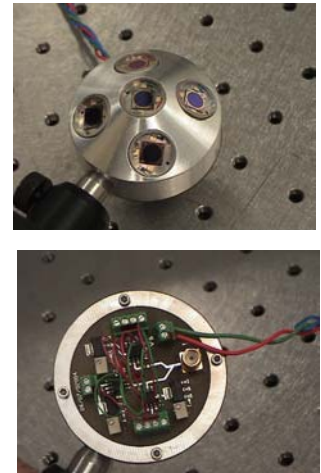


Multiple Quantum Well Modulating Retroreflectors



This compact array, capable of supporting 10 Mbps, provides a 60-deg field of regard



A modulating retroreflector enables two-way optical data communications with one laser and telescope.

The Naval Research Laboratory's Multiple Quantum Well (MQW) modulating retroreflectors (MRRs) are used for low-power infrared (IR) data links. MQW modulators, based on III-V semiconductors epitaxially grown on a substrate, change their optical absorption when a voltage is applied. MRRs combine retroreflectors with electro-optic shutters to enable optical data transfer. They operate at 1550 nm and support upwards of 75 Mbps, depending on the architectures. Since 1998, the Naval Research Laboratory has been involved in developing MRR devices and techniques for free-space data transfer in the IR regime. Recent breakthroughs in device design and fabrication, mount design, holder design, and power consumption demonstrated their feasibility in small, remotely interrogated, low-power communications terminals that can support data rates of hundreds to millions of bits per second.

ADVANTAGES:

- Single-unit design enables lighter weight, more compact array configurations
- Requires very little power
- Compact and secure communication links
- When configured as an array, no pointing and tracking are required

APPLICATIONS:

- Corner-cube devices for asymmetric data links
- Increased efficiency potentially allows use of photovoltaic (PV) cells
- Laser-powered tags or laser-augmented power sources
- Streaming video from UAVs
- Telecommunications between ground stations, aircraft, and spacecraft

CONTACT:

Licensing information:

Jane F. Kuhl • Head, Technology Transfer Office • (202) 767-3083 • kuhl@utopia.nrl.navy.mil

Technical information:

G.C. Gilbreath • Remote Sensing Division • (202) 767-0170 • gilbreath@ccs.nrl.navy.mil

W.S. Rabinovich • Optical Sciences Division • (202) 767-9413 • rabinovich@nrl.navy.mil